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Research Article

Factors influencing the liver stiffness measurement (LSM) detected by Fibroscan in chronic HBV infectors

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ABSTRACT

Introduction: Liver biopsy has been considered the most important thing for the assessment of liver fibrosis. There are many rare complications which are associated with liver biopsy. Pain and hypotension are the most common complication with patients.**Objectives of the study:** The basic aim of the study is to find the factors influencing the liver stiffness measurement (LSM) detected by Fibroscan in chronic HBV infectors. **Material and methods:** The study was conducted at Lalamusa hospital with the permission of ethical committee of hospital during October 2017 to December 2017. The data was collected from both genders and the sample size was 50.**Results:** All the studies explains patients with chronic infection of Hepatitis, the progress and treatment depends upon the staging of the liver fibrosis. The staging of liver fibrosis is also important in determining and designing the drug combination and treatment. The chronic viral infections, as that in hepatitis, also proceed with elevation in ALT levels in the body and have contribution in the progression of fibrosis.**Conclusion:** In these patients, liver stiffness measurement (LSM) values may be limited by elevated ALT, and the LSM cutoff values for each disease stage vary from study to study due to differences in hepatic fibrosis etiology and differences in populations.

INTRODUCTION

Liver biopsy has been considered the most important thing for the assessment of liver fibrosis. There are many rare complications which are associated with liver biopsy. Pain and hypotension are the most common complication with patients. Transient elastography has been evaluated extensively as a non-invasive tool to assess liver fibrosis[1]. FibroScan is a non-invasive instrument to detect hepatic fibrosis, which is based on the technology of the elastic imaging of ultrasound. The liver solidity, which reflects the fibrosis intensity of the liver, can be evaluated by detecting the instant elasticity of the liver[2]. Liver stiffness was measured by transient elastography using FibroScan. Recently, transient elastography has become available as a new method in the non-invasive treatment of liver fibrosis. Even though earlier studies had been performed on patients with chronic hepatitis C, more recent studies have shown transient elastography to be similar in accuracy in patients with chronic hepatitis B[3]. Initial studies have shown that liver stiffness measurement with transient elastography correlated well with underlying liver fibrosis, with

good diagnostic performance. Most of these studies have been performed on patients who suffer from hepatitis C due to less available of data on chronic hepatitis B[4].

The main aim of this research is to present a review of various factors that influence the measurement of Liver Stiffness Measurement (LSM) by Fibroscan in patients with HBV chronic infection. Some of the important factors include age, gender, albumin, liver inflammation represented by alanine transaminase (ALT), aspartate transaminase (AT), total billirubin (TBIL) level, HBV replication (HBV DNA loads), portal vein pressure (portal vessel diameter, PVD), splenic thickness (SPT) and body mass index (BMI)and GGT[5-7].

Objectives of the study

The basic aim of the study is to find the factors influencing the liver stiffness measurement (LSM) detected by Fibroscan in chronic HBV infectors.

Material and methods

The study was conducted at Lalamusa hospital with the permission of ethical committee of hospital during October 2017 to December 2017. The data was collected from both genders and the sample size was 50.

Study Inclusion/Exclusion Criteria

Patients were selected if they are at the following inclusion criteria:

(1) The study evaluated the factors affecting liver stiffness measurement using Fibroscan. Studies including patients with other causes of liver disease were excluded.

(2) Liver biopsy was used as the reference standard for assessing fibrosis. According to comparable systems, they classified the fibrosis stages $F \geq 2$, $F \geq 4$; the Ishak system was $F \geq 3$, $F \geq 5$.

Data Extraction

Some pre-specified factors to undergo the analysis included age, gender of the patient, albumin levels, liver inflammation represented by alanine transaminase (ALT), aspartate transaminase (AT), total billirubin (TBIL) level, HBV replication (HBV DNA loads), portal vein pressure (portal vessel diameter, PVD), splenic thickness (SPT) and body mass index (BMI) and GGT (gamma gultamyl transpetidase). The other variables that were taken into account included liver fibrosis (or liver stiffness scan) using fibroscan and patients with chronic HBV infection. Patients with liver diseases other than these reasons were excluded from the study.

Data Analysis and Synthesis

The data was analyzed using SPSS version 17.0 for SE and SD.

RESULTS

All the studies is explained in the table 01.The table 01 explains patients with chronic infection of Hepatitis, the progress and treatment depends upon the staging of the liver fibrosis. The staging of liver fibrosis is also important in determining and designing the drug combination and treatment. The chronic viral infections, as that in hepatitis, also proceed with elevation in ALT levels in the body and have contribution in the progression of fibrosis. Therefore in treating HBV infection, designing the antiviral therapy depends on staging of fibrosis. All the studies showed that liver fibrosis and LSM were higher in CHB infected patients with elevated levels of ALT. And there was a positive correlation between LSM, ALT and male gender among all the patients with HBV infection.

Liver Stiffness Measurement (LSM) kPa	Hepatitis B antigen (HBeAg)	% stage II	% stage III	% stage IV	ALT (IU/L)	Mean BMI (kg/m^2)
6.6 (1.5–75.0)	-	-	-	-	33 (8–962)	-
16.8 (6.9–47.2)	-	-	-	-	1464	-
11.9 ± 8.7	-	60 (30.2)	37 (18.6)	99 (49.7)	114.4 ± 160.1	23.6 ± 3.1
12.9 ± 8.6	-	23.9	14.6	23	40.6 ± 17.2	-

17.4 ± 6.2	103/253 (41%)	92 patients with F≥2	-	46 patients with cirrhosis	80±154 (Normal ALT and transaminases).	-
7.7	408 (36.1)	-	-	-	38.8 ± 27.2	-
9.9 ± 7.2	85 (48.6%)	-	0.95 (95% confidence interval, 0.91–0.98)	0.98 (0.96–0.99)	40.1 ± 18.6	-
21.7 ± 11.5	-	73.7±149.1		54.7±45.4	64.2 ± 97.25	-
12.9 (4.4–57.1)	-	97 (75.8)	18 (14.1)	110 (85.9)	44.46 ± 21.6	24.06 ± 2.9

Table 01: Analysis of liver stiffness in chronic HBV infection

DISCUSSION

Transient elastography has been evaluated extensively as a non-invasive tool to assess liver fibrosis. In a systemic review of published studies, liver stiffness measurement (LSM) by transient elastography has high sensitivity and specificity to detect histological liver cirrhosis[8]. The liver stiffness was expressed in kilo Pascal (kPa). Patients with elevated ALT levels tend to have higher LSM than those with normal ALT levels at the same stage of liver fibrosis. Patients with elevated serum ALT levels had higher LSM values despite having the same degree of liver fibrosis. FibroScan is a non-invasive instrument to detect hepatic fibrosis, which is based on the technology of the elastic imaging of ultrasound[9-10]. The liver solidity, which reflects the fibrosis intensity of the liver, can be evaluated by detecting the instant elasticity of the liver. Liver stiffness was measured by transient elastography using FibroScan. Collectively, the value of FibroScan was greatly affected by the ALT levels, whereas the value for LecT-Hepa was not influenced regardless of the ALT levels[11]. This is the first study comparing LecT-Hepa with FibroScan. Most of these studies have been performed on patients who suffers from chronic hepatitis C because of less availability of the data on chronic hepatitis B. Biochemistry were assessed at the same time of liver biopsy, including AST, ALT, bilirubin, gamma glutamyl transpeptidase (GGT), albumin , alpha-1 globulin , alpha-2 globulin, and albumin to globulin ratio. The lab test of hematology was also performed at the same time and they include hemoglobin (Hb), platelet count, white blood cells (WBCs), prothrombin time and alpha-fetoprotein[12].

CONCLUSION

In these patients, liver stiffness measurement (LSM) values may be limited by elevated ALT, and the LSM cutoff values for each disease stage vary from study to study due to differences in hepatic fibrosis etiology and differences in populations.

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